

ABSTRACT OF THE DISCLOSURE

A microfluidic device having integrated components for conducting chemical operations. Depending upon the desired application, the components include electrodes for manipulating charged entities, heaters, electrochemical detectors, sensors for temperature, pH, fluid flow, and other useful components. The device may be fabricated from a plastic substrate such as, for example, a substantially saturated norbornene based polymer. The components are integrated into the device by adhering an electrically conductive film to the substrate. The film may be made of metal or an electrically conducting ink and is applied to the device through metal deposition, printing, or other methods for applying films. Methods for reducing bubble formation during electrokinetic separation and methods for heating material in a microfluidic device are also disclosed.